PATENT SPECIFICATION 908,098

DRAWINGS ATTACHED.

Date of Application and filing Complete Specification :
April 4, 1961. *No. 11933/61.*

Application made in Germany (No. H34776) on April 25, 1960.

Complete Specification Published : Oct. 17, 1962.

Index at Acceptance:—**Classes 87(2)**, A1R14C1X; **and 113**, G.

International Classification:—B29f. B63b.

COMPLETE SPECIFICATION.

Clamping Device for Holding Thermoplastic Foils During Shaping Thereof.

We, FR. HESSER, MASCHINENFABRIK-AKTIENGESELLSCHAFT, a Company organised under the laws of the Federal Republic of Germany, of 99 Nauheimerstrasse, Stuttgart-Bad Cannstatt, Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention is concerned with a clamping device comprising a plurality of clamping frames and their associated holders for holding thermoplastic foils which are to be shaped.

To hot shape thermoplastic foils, the latter are usually firmly held in a flat condition between two clamping frames which are movable relatively to each other. With large clamping frames, however, it is difficult to align the holders carrying these frames so that there is sufficient clamping pressure at each point of the margins of the frames bearing against each other when the device is in the operative position. If the holders are not guided accurately together, then considerable force is necessary to firmly hold the foils between the closed frames in the required way.

To obviate this disadvantage, in accordance with the present invention it is proposed to mount the clamping frames in the associated holders so as to be relatively pivotable about two axes at right angles to one another. By this means the frames are correctly aligned by the action of clamping the foil.

The invention can be implemented by having each clamping frame mounted in a holding frame for pivoting about its axis of symmetry or about an axis passing through its centre of gravity such that the pivotal axes of the two frames cross when the device is in the operative position.

A further possibility, with the invention is to have one clamping frame fixedly mounted in the associated holding frame, and its counter clamping frame mounted for pivoting about two axes at right angles to one another in its holding frame. Moreover, this gimbal mounting has the advantage that the clamping frames may be quickly and simply changed for a variation in format.

A preferred example of embodiment of the invention will now be elaborated hereafter with reference to the accompanying diagrammatic drawings.

Figure 1 shows an embodiment of the clamping device according to the invention in the open position.

Figure 2 shows the clamping device according to Figure 1 in the closed position.

The clamping device according to Figures 1 and 2 includes two holding frames 2 and 3 pivotally connected together by means of a hinge 1, and two clamping frames 4 and 5 arranged one in each holding frame. The clamping frames 4, 5 are mounted for pivoting about their axes of symmetry 6 and 7 respectively in the holding frames 2, 3 by means of pins 8, 9, so that these axes 6, 7 cross when the device is in the operative position, that is when the clamping frames 4, 5 bear against each other.

When a foil is clamped between the two frames 4, 5, the clamping margins of the latter are accurately aligned, so that all points on the whole bearing surfaces of the margins of the frames are under a continually uniform pressure.

Naturally, in contrast to the embodiment of Figures 1 and 2, it is possible to have one of the clamping frames stationary and

[*Price 4s. 6d.*]

to have only the associated counter clamping frame mounted on gimbals, that is for movement about two at right angles to one another. In this case, an additional frame is provided between the movable clamping frame and the holding frame thereof, said additional frame supporting the clamping frame for pivoting about the axis of symmetry or about an axis passing through its centre of gravity and, in its turn, being mounted for pivoting about an axis transverse to this axis in the holding frame concerned.

WHAT WE CLAIM IS:—

1. A clamping device for holding thermoplastic foils during shaping thereof, comprising two clamping frames which are mounted in associated holders and are relatively pivotable about two axes at right angles to one another.

2. A clamping device according to Claim 1, characterised by the fact that each clamping frame is mounted in a holding frame for pivoting about its axis of symmetry, or about an axis passing through its centre of gravity such that the pivotal axes of the two frames cross when the clamping device is in the operative position.

3. A modification of the clamping device according to Claim 1, characterised by the fact that one clamping frame is fixedly mounted in the associated holding frame and its counter clamping frame is mounted for pivoting about two axes at right angles to one another in the holding frame thereof.

4. A clamping device substantially as hereinbefore described with reference to the accompanying drawings.

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Abingdon : Printed for Her Majesty's Stationery Office, by Burgess & Son (Abingdon), Ltd.—1962.
Published at The Patent Office, 25, Southampton Buildings, London, W.C.2,
from which copies may be obtained.

Problems

(1) Clamping frames move against one another

(2) pins, if not aligned perfectly, there may be a problem in operating the device

Also, there is no statement as to material composition of these pins

(3) Angles - [illegible] design

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908,098 COMPLETE SPECIFICATION

1 SHEET

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Fig. 1

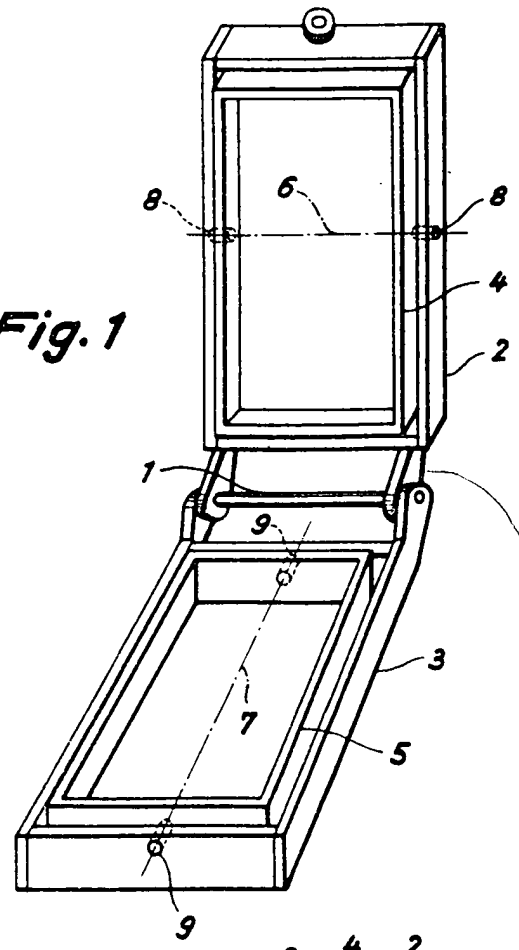

Fig. 2